

## FIGHTING FIFTY YEARS HENCE

Hudson Maxim Discusses the Era of Maritime and Aerial Warfare

## WONDERS OF THE NEW EXPLOSIVES

Time Approaching When the Battleship of Today Will Be a Floating Coffin—Torpedo Guns to Supplant Cannon.

Could we look into the future, as we can into the past, and view in perspective all the great events, what shattered hopes and wrecked dreams we should at times detect a sea of blood? The millennium, when universal peace shall prevail, is yet far off. For a long time to come blood and iron will be accompaniments of material progress.

By the lessons of the past, writes Hudson Maxim in *Scientific American*, we have been directed to the improvement of the present, and by the lessons of the past and present improvements we may look with some degree of intelligence into the immediate future. Radical improvements, however, meritorious, always have a half-century recognition and adoption, and it will probably be many years before such a complete revolution will be effected in arms and armaments as the most advanced inventors of the present time can now see, sooner or later, come.

Predict that the battleship will soon become obsolete, that heavy armor-bearing vessels will be found impracticable in the face of automobile torpedoes, sent through the water, and aerial torpedoes, hurled through the air. On land and sea, torpedo guns will take the place of the present heavy high-power cannon.

The magazine rifle and the machine gun will maintain their present sphere of usefulness, and so will guns used for throwing shrapnel and canister. Therefore, fifty years hence land arms and armaments will consist of automatic machine guns and magazine rifles, improved to the utmost degree of refinement, guns for throwing shrapnel and canister and siege torpedo cannon, capable of throwing large quantities of some high explosive. Projectiles will also be thrown from the torpedo gun for the purpose of producing a veil of smoke in front of an enemy's position, previous to an attack.

Torch bombs will also be used for lighting up an enemy's position at night, to guide an attacking party.

## Doom of Battleships.

At sea, the battleship will be replaced by very swift and light torpedo boats, some adapted to carry automobile torpedoes, and others for torpedoes guns. There will probably be large cruisers, but unarmored, or nearly so—that is to say, they will carry armor sufficient to resist ordinary machine-gun fire, which will still be in use. These cruisers will be very large and very swift, and will carry huge torpedoes, throwers and tremendous batteries of quick-firing guns of small caliber. Each of these will be accompanied by, or will carry on board, torpedo launches, provided with automobile torpedoes, for their protection on the approach of danger.

The large cruisers will be devoted principally to transportation purposes and to carrying supplies for the smaller craft, which will do the most of the fighting.

In the past we have seen improvements in implements of war followed by a decrease, instead of an increase, in the number of casualties in battle, destruction of property largely displacing destruction of life, and, in future, we may expect that still more fighting will be done by machinery, and less by hand. Future wars will become more and more those of wealth against wealth; and, although bloodshed will not be entirely eliminated, the shedding of blood will be largely replaced by the spending of money. War of the future, we may expect, will be fought more so, fifty years hence, it will not be the deadliness of wars, as is often supposed, but their expense, which will make them unprofitable and impracticable.

As the very reason d'être of war is for the defense of the material interests of the nations, as there is no interest in war, and especially in proportion as they become international, the danger of resorting to arms to settle differences will become greater, because of the far-reaching interference with established trade.

Wars will no longer be fought for the protection of interests when the very act shall entail the sacrifice of those interests. To tie the nations with commercial bonds will be to tie up the sword arm of Mars.

It will, however, be many generations before the ties of trade will unite all nations and peoples in such bonds of mutual self-interest as will make peace secure. There will be, in the meantime, many bloody wars—wars frightfully expensive, waged with engines so destructive as to appall the imagination.

The doubling of the range of firearms has had, as its logical result, the doubling of the distance between contending armies, and the doubling of the length of the lines of battle, so that the number engaged covers four times the former area. The result of this dispersion is to lessen the casualties and to increase the time and expense of gaining a victory.

The modus operandi of successful fighting, according to military history, is for the attack to concentrate its force upon a given point, usually the center of the enemy's position, and crush it, and then to turn upon the wings and destroy them in succession. Napoleon stated that the secret of winning a battle consists in being strongest upon a given point.

Formerly, when soldiers fought with swords, spears and bows and arrows, it was necessary to come to close quarters and it was, therefore, necessary for the attack to mass upon the point to be struck and to expose itself accordingly.

In those days, defeat generally meant annihilation.

With the advent of the long-range modern weapons, it became unnecessary to mass the attacking party; it only became necessary to concentrate its fire. By this means, the same effect is produced as formerly, but without a similar exposure of the troops.

## Wonders of the New Explosives.

At sea, however, the battleship still exists as a paradox in all true philosophy of modern warfare. It has been demonstrated that, with progressive smokeless powder, charges of any required size may be employed for throwing aerial torpedoes, and the pressure in the gun regulated exactly as may be desired, for the attainment of the highest velocity, and without any danger whatever of overheating the gun. Furthermore, there are a number of high explosives, as strong as the most powerful dynamite, which can be thrown from ordnance at any required velocity with perfect safety. I have recently developed a new high explosive called maxinite, which is being tested by the United States government, with a view to its adoption. It is more powerful than anything heretofore tried, while it is so insensitive to shock that it may be not only safely thrown from ordnance with powder charges, but armor-piercing shells filled with it may be fired through armor plate, and the maxinite will not explode until it has passed through the plate. A single shell filled with this material, fired from one of our largest guns, and exploding inside a battleship, would probably place her hors de combat.

The present twelve-inch sea coast rifle

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## CREATOR OF HOT STUFF IN WASHINGTON

Secured Political Leaders and Sentenced to a Ducking as a Scold—Romantic Childhood Among Frontier Indians.

## Torpedo Guns Will Supplant Cannon.

I predict that in the future large torpedo guns, capable of throwing such quantities of high explosives as to render armor plate useless, will replace the heavier cannon now carried on shipboard. I have also invented a new compound called maxinite, a material capable of burning without atmospheric oxygen, producing a very hot flame. It is proposed to burn this material in a confined space, under pressure, and utilize the heat of the products of combustion, or flame, to evaporate water by directly mixing the water with the flame. No boiler will be required. The products of combustion and the steam thus generated will be utilized for driving turbines for the propulsion of torpedo boats and automobile torpedoes. Experiments have already been concluded which demonstrate the perfect practicability and utility of this invention.

A torpedo boat, such as the already designed one, would be adapted to travel on the surface of the water in the same manner as the torpedo boats and torpedo boat destroyers now in use. It would be supplied with ordinary steam boilers and steam engines, and the steam thus generated would be utilized for driving turbines for the propulsion of torpedo boats and automobile torpedoes. Experiments have already been concluded which demonstrate the perfect practicability and utility of this invention.

In place of the extra weight of engines and boilers thus saved I propose to carry a quantity of maxinite, with auxiliary engines and turbines, sufficient to develop enough horse power to propel the boat through the water at the speed of the fastest express train—say, at the rate of a mile a minute. Enough maxinite could be carried to develop this speed for half an hour.

## David and Goliath in Sea Fights.

Means will be provided for regulating the combustion of the maxinite, so that only just such a quantity as desired may be burned in a given period. It is intended that, before going into action, this motor-driven torpedo boat will assume a semi-submerged position, leaving above water only its lookout tower and a long, thin back, simply for flotation purposes.

This boat, sighting at a distance of ten miles, a battleship going at a high speed of twenty miles an hour, would be able to gain upon it at the rate of forty miles an hour, and overtake it in fifteen minutes.

As so little of the torpedo boat would show above the surface, and as its speed would be so great, it would be practically impossible for the battleship to hit it with any of its larger guns; and, as the lookout tower would be armored, machine-gun fire would have no effect upon it. The torpedo boat would rush upon the battleship, launch two or three automobile torpedoes, the latter also driven with maxinite, and capable of traveling at the rate of a mile a minute, and, within a few seconds, there would be a tremendous explosion, and the battleship would be sunk.

## ANDREW JACKSON AS A SOLDIER.

## Mistakes Blotted Out by His Triumph at New Orleans.

Of all the careers in our army, writes General F. V. Greene in *Scientific American*, there is no more dramatic than that of Andrew Jackson. His military life was a series of triumphs, but his private life was a series of mistakes. He was a man of great energy and great courage, but he was also a man of great pride and great ambition. He was a man who would do anything to win, and he was a man who would do anything to keep his place. He was a man who was not afraid to take risks, and he was a man who was not afraid to die. He was a man who was not afraid to be hated, and he was a man who was not afraid to be loved. He was a man who was not afraid to be a hero, and he was a man who was not afraid to be a villain.

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Indians, on the banks of the Ohio river, resolved to rescue her. Little of this romance is known, but the sequel tells that the dashing young soldier married the girl who, to all appearances, save in color and Anglo-Saxon mold of her features, was of Indian blood.

After their marriage Captain and Mrs. Royall moved to Alabama, where the woman, who afterward accomplished more than any other woman of her time, began the elementary studies. Not only had she to learn the English tongue, to read it and write it as well as speak it, but the ordinary accomplishments of a civilized child, such, for instance, as mounting the stairs, drinking from glasses or cups, eating with knives, forks and spoons, sitting in a chair and sleeping in beds had to be learned—all these to be acquired after she had reached the age of 20. Yet it was done, this woman, with the savage rearing, who in the prime of her life, was ranked with the thinkers of the English-speaking world, and caused more reforms in the routine of the government, unearthing and exposed more frauds than almost any ten men of her era.

## Motive for Her Action.

It has been said to the discredit of Anne Royall that her actions in public life resulted from what she believed to be the injustice of the government, but if we judge by the philosopher who tells us that "talent can but genius must," we are forced to conclude that Anne Royall's career in the public eye was the inevitable result of genius.

In 1832, after the death of Captain Royall, his widow came to Washington to ask that her pension be increased. An investigation by the court, which then controlled these matters, proved that Anne Royall had not married Captain Royall until one month after his resignation from the Continental army and, disregarding his brave deeds in the revolution as well as numerous campaigns he led against the Indians, the court refused to increase her pension but cut it off entirely.

Thus thrown on her own resources she rose equal to the occasion and put to use the education she had acquired under her husband's tutelage and this, enhanced by her wide experience and fearless nature, helped her for the struggle which was to follow.

In 1826 she published her first book, "Life and Manners in the United States," in which she scathed the moral condition as well as social state of the capital at that time. This book was published in New Haven and met with a moderate success. The following year she published "The Tennesseean," and in the latter part of 1827 the greatest work of her life, "The Black Book."

She published several volumes of more or less importance at the time and then returned to Washington from her travels, to the north and the south she started the publication of the Washington Paul Pry. This publication opened a new era in the social world of Washington. Indifferent to criticisms or social treatment—in fact, she rather gloried in the abuse of those who feared her—she did not hesitate to attack statements from the highest state officials to the lowest officeholders.

She scoffed at the claims of the other "American newspapers"—free and independent—and declared that they were owned by their patrons and feared to give anything but honey to their readers' taste. "They should go with the wind," she said, "and openly attacked Secretary Cass, showed up the high lights and shadows of the 'Kitchen cabinet' and was, in fact, the first writer in the United States who dared to so dub President Jackson's secretaries. Secretary Ely was also one of her subjects of public attack, his political as well as private character.

John Quincy Adams' memoirs, says of her: "She is a strange creature, in one-chained armor, redeeming herself from the cramps of poverty by the notoriety of her eccentricities, the insane fearlessness of her attacks on public characters. She was the terror of politicians and especially of the cabinet. I can see her now, standing through the halls of the old capitol, her keen eye searching every passerby, her thin lips firmly set like that of a man, an old woman, yet possessed of great industry and indomitable will. She possessed withal a most remarkable memory. I have never known."

In 1830, the enemies of Anne Royall, those who had been pursued and nagged at by her, had her indicted on the charge of a "conspiracy to defame the government."

Some years ago, relates the New York Sun, a dispatch was received by a New York editor from the editor of a Chicago newspaper which had not a reputation for spotlessness, but which frequently published some startling truths. The dispatch gave the outlines of a reported Wall street scheme in which the Armours were deeply concerned and it asked the co-operation of the New York editor in ascertaining the facts. A reporter was assigned to this work and he called upon the late H. O. Armour, who was then in charge of the Armour interests in New York City.

When the reporter's errand was stated Mr. Armour was furious. He denounced the story of the receipt of such a dispatch from Chicago as a lie and the reporter's errand as part of a wicked scheme of a jobber's scheme to affect the Armour properties. The reporter replied that when he had received at his office he meant exactly what his words indicated, and he requested Mr. Armour to tell him something about the story the dispatch contained or to say whether that story was false.

But Mr. Armour wouldn't do it. He only inveighed against the reporter's chief and repeated that that gentleman had not received any such telegram.

"Will you give me \$1,000," Mr. Armour exclaimed, "that you editor cannot give me such a dispatch, and you tell me so?"

"Mr. Armour," was the reply, "I do not carry \$1,000 or a check book, but if you will hold that bet open fifteen minutes I will go out into the street and come back and take it up with cash. It will only be necessary for me to see one of my nearby friends."

Mr. Armour mellowed somewhat after looking intently at the reporter for a moment. Then he said:

"Your word for it. The bet is good."

The reporter went back to the square of the printing houses and recited his experience. He also made a strong request to be permitted to teach Mr. Armour a lesson, as he put it, not by printing anything about his experience, but by showing him the telegram and forcing him to pay the bet. The request was granted and when Mr. Armour saw the dispatch he turned pale and wrote a check for \$1,000 forthwith and handed it to the reporter. Then he said that the dispatch lied. And at any rate

"common scold." She was hurriedly tried and convicted, and it was only through the intercession of Francis Scott Key, who appealed to Jackson, pointing out what a disgrace it would be for an old woman to be subjected to the ducking stage, that the sentence was changed to a fine and bond for good conduct for one year. This time Anne Royall did not waste, but with vigor and deepened hatred, she pursued her old enemies, and in her third series of "The Black Book" showed up more corruption in the social and political spheres of the new country than had hitherto or have since been exposed. She hesitated at nothing that would or might reveal the dishonesty or her enemies. She took a lively interest and an active part in the trial of Tobias Watkins and other noted cases of the day.

After the success of "The Black Book" she began the publication of "The Huntress," which was the successor to "The Washington Paul Pry." During the life of this publication she was on several occasions threatened with another indictment on the charge of public scandal and several threats were made on her life. However, she concluded to publish this until 1834, when she tired of her vocation and retired to the seclusion of her home, where she continued a series of publications along the line of "The Black Book." Her deep hatred for Secretary Cass, Judge Cranch and others who had persecuted her died only with her. Her last days were spent in Washington, where she was the friend and not infrequently the adviser of some of the greatest public men at that time. After her death it was found from her memoirs that she regarded Daniel Webster as the most remarkable man of her wide acquaintance. In all, Anne Royall, with all of her bitterness and hatreds, in her sincerity and remarkable achievements, might well be numbered among the great.

## JAPANESE RAILWAYS.

Over Three Thousand Miles of Iron Road in Operation.

Extension of the railway system in Japan goes on uninterruptedly, says Engineering. The most recent returns give the length of the railway lines as 3,535 miles—333 miles of government and 3,202 miles of private railway—on March 31, 1900. This makes an increase of sixty-five miles of government and 150 miles of private railway since April 1, 1899, a length of 215 miles in all. The principal private lines are the Nippon railway, mileage, 457 miles; Kanto railway, mileage, 270 miles; Sanjo railway, mileage, 330 miles; Hokkaido Tanko railway, mileage, 207 miles.

A private railway law and railway business law were promulgated on March 15, 1900, for the better exercise of control over the construction of railways and matters connected with railway work in general, etc., and regulations for the carrying out of the private railway law, setting forth in detail the method of obtaining official sanction to railway undertakings and the mode of operations, etc., were issued on August 10, 1900. The above laws and regulations came into force on October 1, 1900. Sleeping cars were brought into use on the Tohoku line from the same date. Speaking of locomotives, the above journal says that the Japanese railway companies, with few exceptions, have discarded American locomotives in favor of those of British manufacture, merely using up, but not replenishing, their stock of the former, as they have experienced so much trouble from their boilers. It is only by one or two of the smaller railway companies and of the Hokkaido railway that orders for locomotives are still placed in the United States, and for two reasons—cheapness and dispatch.

For example, specifications were recently issued for locomotives for the Hokkaido railway, for which twenty locomotives were allowed to tender, but both the limit of time and the price obtainable were insuperable obstacles to the order being given to the United Kingdom. During 1900, thirty locomotives were ordered from British factories, an order for twenty-four locomotives valued at \$60,000, being placed in November. Two of the four sleeping cars which are in use on the government railway came from England, and two from the United States. The former are found to be much better and to give greater satisfaction. While it is probable that those required for future use will be constructed in Japan, the United Kingdom will benefit by supplying the fittings, such as wheels, axle bars, buffers and springs, which are not made here. The Formosan railway last year ordered six locomotives from the United Kingdom to be delivered at Keelung, and steel and other materials for bridge making. To save duty the bridges are made at Osaka and thence sent on to the island.

Special Articles each week, JAMES ATKINSON, of the Iowa Experiment Station at Ames.

Letters of Travel—FRANK G. CARPENTER.